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## A CRITIQUE OF *IN RE BILSKI*

By Maayan Filmar<sup>1</sup>

“[T]he trajectories of culture, economics and technology have reached a point where a distinction between idea and machine can no longer be sustained; where no bulwark of logic, but only the mist of undecidability, separates  $E=mc^2$  from the light bulb.”<sup>2</sup>

### I. INTRODUCTION

Under 35 U.S.C. § 101 (“section 101”), patent protection is provided to “whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof . . . .”<sup>3</sup> Industrial age inventions fell easily into at least one of these four statutory categories.<sup>4</sup> Information age inventions, however, complicate the analysis under section 101 and blur the boundaries of its enumerated categories.<sup>5</sup> A common characteristic of these information age inventions, namely software and electronic commerce, is that they are not traditional subjects of patent law.<sup>6</sup>

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1. LL.M. Benjamin N. Cardozo School of Law, 2009; LL.B. Haifa University, Israel 2008; B.A. in Economics Haifa University, 2008. The author gratefully appreciates the helpful comments and the excellent guidance from Professor Alan Wolf.

2. James Gleick, *Patently Absurd*, N.Y. TIMES MAG., Mar. 12, 2000, at 48 available at <http://www.nytimes.com/library/magazine/home/20000312mag-patents.html>.

3. 35 U.S.C. § 101 (2006).

4. Stephen Korniczky, *The New Landscape of Patentable Subject matter Under 35 U.S.C. § 101- Applying an Industrial Age Test to Information Age Innovations*, INTELL. PROP. TODAY, Jan. 2009, at 12 available at <http://www.iptoday.com/articles/2009-1-kornickzy.asp?>.

5. *Id.*

6. Jay P. Kesan & Andres A. Gallo, *Why “Bad” Patents Survive in the Market and How Should We Change? The Private and Social Costs of Patents*, 55 EMORY L.J. 61, 67 (2006).

Often times, they are intangible.<sup>7</sup> Hence, in light of their complexity, the Patent Office and the courts struggle to decide whether and to what extent these inventions deserve the protection of the Patent Act.<sup>8</sup>

In 1998, the Court of Appeals for the Federal Circuit radically changed the landscape regarding software and business method patents.<sup>9</sup> Its *State Street*<sup>10</sup> decision opened the floodgates to business method and software-related claims.<sup>11</sup> Indeed, according to the World Intellectual Property Organization's statistical report from 2008, the annual growth of patent filings in the field of computer technology between 2001 and 2005 was 5.3%,<sup>12</sup> the highest compared to other fields of technology.<sup>13</sup> This great increase in filings of software-related patents, however, resulted in public pressure to make it more difficult to obtain them.<sup>14</sup>

Recently, the Federal Circuit took a step away from *State Street*'s broad interpretation of section 101.<sup>15</sup> On October 30, 2008, it decided *In re Bilski*.<sup>16</sup> The Federal Circuit reconsidered the scope of section 101 and held the "machine-or-transformation" test to be the sole test to determine whether a process is patent

7. Korniczky, *supra* note 4, at 12.

8. See John R. Allison & Mark A. Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, 77 (2002).

9. Kristen Osenga, *Ants, Elephant Guns, and Statutory Subject Matter*, 39 Ariz. St. L.J. 1087, 1089 (2007).

10. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998).

11. Lilly He, *In Re Bilski En Banc Rehearing on Patentable Subject Matter: Farewell to Business Method Patents?*, 14 B.U.J.SCI. & TECH. L. 252, 253 (2008).

12. WORLD INTELLECTUAL PROPERTY ORGANIZATION, WORLD PATENT REPORT – A STATISTICAL REVIEW 2008 41 (2008), available at [http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo\\_pub\\_931.pdf](http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo_pub_931.pdf).

13. *Id.* (Growth rates in other notable fields: medical technology- annual growth of -2.1%, biotechnology- annual growth of -2.7%, pharmaceuticals- annual growth of 1.7%, machine tools- annual growth of -0.6%, and civil engineering- annual growth of 1.5%).

14. See Osenga, *supra* note 9, at 1091.

15. Korniczky, *supra* note 4, at 12.

16. *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc).

eligible.<sup>17</sup> As a result, “a claimed process is surely patent-eligible under section 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”<sup>18</sup>

This article argues that *Bilski*’s “machine-or-transformation” test should not be the test to determine patent-eligibility of process claims under section 101. As it will demonstrate, *Bilski*’s test is ambiguous, inconsistent with Supreme Court precedent, and fails to adequately address the problem courts are really concerned about: the issuance of “bad” and costly patents.<sup>19</sup> If the Supreme Court will not abandon this test, trivial and absurd inventions, such as “a method for swinging on a swing”<sup>20</sup> or a method “for exercising curious animals, especially pet cats” with a laser pointer<sup>21</sup> will continue to be patentable.

Instead of *Bilski*’s “machine-or-transformation” test, this article will suggest returning to the practical, well-established standards to determine patent-eligibility under section 101: “anything under the sun that is made by man”<sup>22</sup> should be patentable, with the exception of “laws of nature, natural phenomena, or abstract ideas.”<sup>23</sup> Indeed, the subject-matter doctrine is the best mechanism to address the issues raised by “bad inventions.” Under these standards, section 101 would remain flexible and easily applicable. To facilitate the application of these limitations to the field of software, this article will suggest establishing an advisory committee of software experts that will advise the Patent Office and the courts as to the patentability of software inventions under section 101. Consequently, the “gate-keeping”<sup>24</sup> function of

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17. Mark C. Scarsi & Blake Reese, *Refining (or redefining) Patentability: Post-In Re Bilski Developments*, PAT., TRADEMARK & COPYRIGHT L. DAILY (Feb. 4, 2009).

18. *Bilski*, 545 F.3d at 954.

19. See Peter M. Kohlhepp, Note, *When the Invention Is an Inventor: Revitalizing Patentable Subject Matter to Exclude Unpredictable Processes*, 93 MINN. L. REV. 779, 799 (2008).

20. U.S. Patent No. 6,368,227 (filed Nov. 17, 2000).

21. U.S. Patent No. 6,701,872 (filed Oct. 30, 2002).

22. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

23. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

24. *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 597 (1993) (holding that federal trial judges have a “gatekeeping role” for the admission of

section 101 will be successfully preserved.

Part II of this article will provide a short summary of the majority opinion in *In re Bilski* and demonstrate its inconsistency with Supreme Court precedent. Part III will discuss the ambiguity of *Bilski*'s "machine-or-transformation" test. Specifically, this part will demonstrate how both prongs of the test fail to prevent the issuance of "bad patents." Part IV of this article will discuss the history of software-related patents. Then, it will analyze three main characteristics of *bad* software inventions that justify their exclusion under section 101: triviality, stifling subsequent innovation and overbreath. Part V of this article will suggest how the patent system may successfully prevent the issuance of bad software patents. In particular, it will suggest establishing an advisory committee of software experts that will aid both the Patent Office and the courts in identifying bad software patents. This article will discuss the legal foundation of this committee and its members' qualifications and suggest two alternative solutions to the fundamental problem of confidentiality raised by the use of such external experts.

## II. *IN RE BILSKI*, 545 F.3D 943 (FED. CIR. 2008) (EN BANC).

### A. *The Majority's Opinion*

*In re Bilski* followed the rejection of the patent application of Bernard L. Bilski and Rand A. Warsaw ("Bilski") by the Board of Patent Appeals and Interferences ("the Board").<sup>25</sup> Bilski's invention concerned a method to be utilized by commodity providers for managing consumption risk associated with the sale of commodities, such as natural gas or coal, for a given period.<sup>26</sup> The Board rejected Bilski's claims on the ground that they did not

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scientific evidence). According to the *Daubert* standard, trial judges must evaluate proffered expert witnesses to determine whether their testimony is both "relevant" and "reliable". *Id.*

25. *Ex parte Bilski*, No. 2002-2257, 2006 WL 5738364 at \*1 (B.P.A.I. Sept. 26, 2006).

26. *Id.*

involve any patent-eligible transformation.<sup>27</sup> The Board reasoned that the transformation of “non-physical financial risks and legal liabilities of the commodity provider, the consumer, and the market participants”<sup>28</sup> was not patent-eligible subject matter. In addition, the Board held that Bilski’s claims preempted “any and every possible way of performing the steps of the [claimed process], by human or by any kind of machine or by any combination thereof,”<sup>29</sup> and, therefore, they merely claimed an abstract idea ineligible for patent protection. Finally, the Board held that Bilski’s process did not produce a “useful, concrete and tangible result” because it was not a patent-eligible subject matter.<sup>30</sup>

Bilski appealed to the Federal Circuit, which heard the matter *en banc* to decide the issue of patentability under section 101 of the Patent Act. The issue before the Federal Circuit was “what test or set of criteria governs the determination by the Patent and Trademark Office (“PTO”) or courts as to whether a claim to a process is patentable under § 101 or, conversely, is drawn to unpatentable subject matter because it claims only a fundamental principle.”<sup>31</sup>

To determine whether a claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to preempt all future uses of such principle, the *Bilski* court established a test: “a claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”<sup>32</sup> The Federal Circuit held this test to be the *sole* test to determine the eligibility of different process claims under section 101.<sup>33</sup>

The court elaborated two additional corollaries to clarify its “machine-or-transformation” test. First, it stressed that mere “field-of-use” limitations are generally insufficient to render an

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27. *Id.* at \*18-20.

28. *Id.* at \*18.

29. *Id.* at \*20.

30. *Id.* at \*21-22.

31. *Bilski*, 545 F.3d at 952.

32. *Id.* at 954.

33. *Id.* at 958-961.

otherwise ineligible process claim patent-eligible, and second, it explained that insignificant post-solution activities will not transform un-patentable principles into a patentable processes.<sup>34</sup>

Finally, the court proceeded to apply the “machine-or-transformation” test to Bilski’s claims. Since Bilski conceded that his claims were not limited by any specific machine, the court left the elaboration of this prong of the test to future cases.<sup>35</sup> Regarding the second prong of test, the court acknowledged that *physical* transformation is not mandatory for compliance with this prong. Rather, the Federal Circuit held that under its own precedent,<sup>36</sup> transformation of specific data may also suffice so long as “the claim is limited to a visual depiction that represents specific physical objects or substances.”<sup>37</sup> Under these principles, the court held that Bilski’s claims failed to comply with the transformation requirement of the “machine-or-transformation” test.<sup>38</sup> Reasoning that “purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances,”<sup>39</sup> the court rejected Bilski’s claims as ineligible under section 101.

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34. *Id.* at 961-963. The first corollary, namely that mere “field-of-use” limitation is generally insufficient, originates from *Gottschalk v. Benson*, 409 U.S. 63, 71-72 (1972). The second corollary, namely that insignificant post-solution activities will not transform un-patentable principles into a patentable processes, originates from *Parker v. Flook*, 437 U.S. 584, 590 (1978).

35. *Id.* at 962.

36. *See In re Abele*, 684 F.2d 902 (C.C.P.A. 1982). The court held un-patentable a broad independent claim reciting a process of graphically displaying variances of data from average values. *Id.* at 903. The claim did not specify any particular type or nature of data and did not specify how or from where the data was obtained or what the data represented. *Id.* at 908. Nonetheless, the court held patentable-eligible one of the claims since it explained the type of data (“X-ray attenuation data”), how the data was obtained (“produced in a two dimensional field by a computed tomography scanner”) and what it represented (the structure of bones, organs, and other body tissues-physical and tangible objects). *Id.* at 908-09.

37. *Bilski*, 545 F.3d at 962-963.

38. *Id.* at 964.

39. *Id.* at 963.

*B. Bilski's "Machine-or-Transformation" Test and Supreme Court Precedent*

It appears that *Bilski's* "machine-or-transformation" test is inconsistent with Supreme Court precedent.<sup>40</sup> Indeed, the Supreme Court has never held it to be the sole test for patentable processes under section 101.<sup>41</sup> In fact, the Supreme Court had been always careful to avoid formulating a bright line rule that would freeze section 101 to old technologies.<sup>42</sup>

The majority based its opinion on four prior decisions of the Supreme Court and particularly upon misinterpretation and misapplication of a single statement made in dicta in *Gottschalk v. Benson*.<sup>43</sup> This statement, which provides that "transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines,"<sup>44</sup> originated in the Court's *Cochrane v. Deener* decision.<sup>45</sup> However, *Cochrane* never held that to be patent-eligible, a process *must* result in a physical transformation.<sup>46</sup> *Cochrane* decided whether a process for improving the qualities of superfine flour could be infringed irrespective of the tools used by the alleged infringer to achieve the same result of the process.<sup>47</sup> The patentee argued that his invention was in the process itself, and "not limited to any special arrangement of machinery."<sup>48</sup> Thus, the above statement was made in the context of a

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40. Erika Arner, *Ten Reasons the Supreme Court Should Take In re Bilski*, PATENTLY O, Apr. 1, 2009, <http://www.patentlyo.com/patent/2009/04/guest-post-ten-reasons-the-supreme-court-should-take-in-re-bilski.html>.

41. *Bilski*, 545 F.3d at 978.

42. Christopher A. Harkins, *Throwing Judge Bryson's Curveball: A Pro Patent View of Process Claims As Patent-Eligible Subject Matter*, 7 J. MARSHALL REV. INTELL. PROP. L. 701, 729 (2008). See 35 U.S.C. § 101 (2006).

43. Brief of Am. Intell. Prop. Law Ass'n as Amicus Curiae Supporting Petitioner at 9, *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc), *petition for cert. filed*, (U.S. Jan. 28, 2009) (No. 08-964), 2009 WL 559339.

44. *Benson*, 409 U.S. at 70.

45. Brief of Am. Intell. Prop. Law Ass'n, *supra* note 43, at 9.

46. *Id.* at 10.

47. *Cochrane v. Deener*, 94 U.S. 780, 785 (1876).

48. *Id.*



mechanical process.<sup>49</sup> Nothing in *Cochrane* implied that, to be patent-eligible, *every* future process must perform a transformation of a thing into a different state or thing.<sup>50</sup>

Similarly, in *Benson*, the Supreme Court refused to adopt the “machine-or-transformation” test as the only test to determine patent-eligibility of process under section 101.<sup>51</sup> The Court stated:

It is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a ‘different state or thing.’ We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.<sup>52</sup>

In so holding, the Court refused to adopt the “machine-or-transformation” test as the only test to determine patent-eligibility of process under section 101.<sup>53</sup>

Furthermore, *Bilski*’s majority holding is also inconsistent with *Parker v. Flook*, where the Supreme Court rejected a claim for a process for calculating alarm limits for use in connection with catalytic conversion of hydrocarbons.<sup>54</sup> The Court rejected the invention because it sought to patent a non-patentable law of nature and not because it failed to comply with the “machine-or-transformation” test.<sup>55</sup> Indeed, *Flook* assumed “that a valid process patent may issue even if it does not meet one of these qualifications of our earlier precedents.”<sup>56</sup>

The Federal Circuit’s reliance on the fourth precedent, *Diamond v. Diehr*, is also misplaced.<sup>57</sup> Contrary to the majority’s statement that *Diehr* “once again” applied the “machine-or-transformation” test in evaluating the patentability of a claimed process,<sup>58</sup> *Diehr*

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49. Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 10.

50. *Id.*

51. *Id.*

52. *Benson*, 409 U.S. at 71.

53. *Id.*

54. *Bilski*, 545 F.3d at 979.

55. Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 11.

56. *Flook*, 437 U.S. at 589 n. 9 (citing *Benson*, 409 U.S. at 71).

57. See Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 11-12.

58. *Id.*

merely recognized that a process that transforms an article into a different state or thing — such as the process of curing raw rubber considered in that case — illustrates “the types of processes which have historically been eligible to receive the protection of our patent laws.”<sup>59</sup> Nowhere did *Diehr* suggest that transformation is required for a process to be patent-eligible under section 101.<sup>60</sup> Instead, *Diehr* emphasized that the only limits to patent eligibility are those reflected by the three exceptions of “laws of nature, natural phenomena, and abstract ideas.”<sup>61</sup>

Accordingly, it appears that none of the four Supreme Court precedents cited by the Federal Circuit support the holding that a process is patent-eligible only if it is tied to a machine or it transforms a particular article into a different state or thing.<sup>62</sup> These decisions support a broad interpretation of section 101 and emphasize that a process will constitute a patent-eligible subject matter under section 101 so long as it does not recite one of the three traditional exceptions, namely “laws of nature, natural phenomena, or abstract ideas.”<sup>63</sup> The majority failed to explain why the expansive language of section 101 would “preclude protection of innovation simply because it is not transformational or properly linked to a machine (whatever that means)”<sup>64</sup> and provided no logical explanation as to how the “machine-or-transformation” test would actually exclude process claims that embrace one of above three exceptions.<sup>65</sup>

### III. *IN RE BILSKI* INCREASES VAGUENESS AND UNCERTAINTY

The exact contours of the “machine-or-transformation” test are uncertain.<sup>66</sup> As Judge Newman, one of three dissenters in *Bilski*, stated “uncertainty is the enemy of innovation. These new uncertainties not only diminish the incentives available to new

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59. *Diehr*, 450 U.S. at 184.

60. Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 12.

61. *Diehr*, 450 U.S. at 185.

62. Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 12.

63. *Diehr*, 450 U.S. at 185. *See also Flook*, 437 U.S. at 589.

64. *Bilski*, 545 F.3d at 1012 (Rader, J. dissenting).

65. Brief of Am. Intell. Prop. Law Ass’n, *supra* note 43, at 17.

66. Korniczky, *supra* note 4, at 13.

enterprise, but disrupt the settled expectations of those who relied on the law as it existed.”<sup>67</sup> Although *Bilski* formulated an apparently bright line rule, it failed to provide an adequate explanation of how the “machine-or-transformation” test would be implemented.<sup>68</sup>

*A. The Machine-Implementation Prong of the “Machine-or-Transformation” Test*

*Bilski* left many implementation questions unresolved.<sup>69</sup> The opinion did not address what it means for a process claim to be tied to a specific machine, and particularly, is the recitation of a general purpose computer sufficient to satisfy the machine inquiry?<sup>70</sup> Another unanswered question is what precisely qualify as “insufficient post solution activity?”<sup>71</sup>

Indeed, when the Federal Circuit in *Bilski* turned to apply the “machine-or-transformation” test to *Bilski*’s claimed invention, it noted that it will “leave to future cases the elaboration of the precise contours of machine implementation, as well as the answers to particular questions, such as whether or when recitation of a computer suffices to tie a process claim to a particular machine.”<sup>72</sup>

It appears, however, that “the requirement that software be ‘tied to a particular machine or apparatus’ will not be satisfied by merely reciting that the software is tied to a ‘general-purpose digital computer.’”<sup>73</sup> This assumption was recently affirmed in *Ex parte Halligan*, which concerned a claimed invention for a method or “a programmed computer method” for identifying trade secret data.<sup>74</sup> Although the claim was tied to a computer, the Board held

67. *Bilski*, 545 F.3d at 977.

68. Michael D. Bednarek, et al., *In Re Bilski: The Good, The Bad and The Unanswered- Establishing a Framework for Order in the Patent World*, INTELL. PROP. TODAY, Dec. 2008 at 30 available at <http://www.iptoday.com/articles/2008-12-bednarek.asp>.

69. *Id.*

70. *Id.*

71. Korniczky, *supra* note 4, at 14.

72. *Bilski*, 545 F.3d at 962.

73. *Id.*

74. *Ex parte Halligan*, No. 2008-1588, 2008 WL 4998541 at \*1-2 (B.P.A.I.

that the recitation of the programmed computer did not impose “meaningful limits” on the claim’s scope.<sup>75</sup> Because the computer tie merely added a general purpose computer programmed in an unspecified way to execute the functional steps recited in the claims, the Board found the claim did not satisfy the machine-implementation inquiry under the *Bilski* test.<sup>76</sup> Similarly, in *Ex parte Koo*, the Board found that the claims directed to a method of optimizing a query in a relational database *system* were not tied to a machine or transformative.<sup>77</sup> Reasoning that under the broadest reasonable meaning the word “system” could mean a “software system”, the Board held the claims were not tied to a particular machine.<sup>78</sup>

There are several reasons why the Supreme Court should abandon the particular machine-implementation requirement. A first basic reason is that the Patent Act lists “machine” as a separate and distinct category from process.<sup>79</sup> Second, the Supreme Court has never excluded from patent-eligible subject matter processes that lack machine implementation.<sup>80</sup> Rather, it expressly stressed in *Benson*: “It is argued that a process patent must be tied to a particular machine or apparatus or must operate to change articles or materials to a ‘different state or thing.’ We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.”<sup>81</sup> Third, the Supreme Court should abandon the particular machine-implementation requirement because it is ambiguous. Engineering

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Nov. 24, 2008).

75. *Id.* at \*13. The Board also rejected the claimed over the second prong of machine-or-transformation test holding that that the data was not transformative because it did not represent physical and tangible objects. *Id.*

76. Scarsi, *supra* note 17

77. *Id.* (citing *Ex parte Koo*, No. 2008-1344, 2008 WL 5054161 (B.P.A.I. Nov. 26, 2008)).

78. *Id.* The Board also rejected the claims over the first prong of the machine-or-transformation test, holding that the steps of “evaluating”, “determining” and “reforming” did not constitute transformation of data or signals.

79. Harkins, *supra* note 42 at 725; 35 U.S.C. § 101 (2006). See my following discussion on software patents.

80. *Id.* at 725.

81. *Benson*, 409 U.S. at 71.

designs embodied in computer programs can be implemented in hardware, or in software, in such a way that the user would not be able to distinguish between the two.<sup>82</sup> Although there may be reasons, such as high costs, that encourage developers to embody computer programs in one form or the other, it is clear that software and hardware are equivalent in the sense described above.<sup>83</sup> Therefore, software, if incorporated into read-only memory (ROM) and claimed as hardware, should arguably be patentable under *Bilski*'s test as a special purpose computer.

In fact, computer programs can be arguably viewed as machines that have been constructed in the medium of text, such as source and object code.<sup>84</sup> The similarities between computer programs and physical machines support this argument: both computer programs and machines produce useful behaviors and bring about certain results.<sup>85</sup> Like physical machines, programs usually work together with other programs (and with other machines) to achieve their results.<sup>86</sup> For instance, application programs call upon operating system programs, which call upon microcode programs to execute the program functions.<sup>87</sup> Additionally, programs, like physical machines, are built from functional elements: physical machines are built from physical structures (i.e. gears, wires, and screws) whereas programs are built from information structures (i.e. algorithms and data structures).<sup>88</sup>

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82. Pamela Samuelson, et al., *A Manifesto Concerning The Legal Protection Of Computer Programs*, 94 COLUM. L. REV. 2308, 2316 (1994).

83. *Id.* at 2320. The same idea was expressed by Martin Campbell-Kelly and Patrick Valduriez, in their research. They explained that software cannot be made fully independent of hardware. According to their example, "to bootstrap an operating system, a processor needs to execute special instructions that are built in to the hardware. Firmware (or microcode) which consists of computer code stored in programmable read-only memory (ROM) designates such special purpose software." Accordingly, firmware patents can mix hardware and software inventions thereby blurring the distinction between them. Martin Campbell-Kelly & Patrick Valduriez, *A Technical Critique of Fifty Software Patents* at 4 n.11 (Jul. 18, 2005) (unpublished manuscript, available at <http://ssrn.com/abstract=650921>).

84. Samuelson, *supra* note 81, at 2316.

85. *Id.* at 2320.

86. *Id.* at 2320- 2321.

87. *Id.* at 2321.

88. *Id.*

Thus, it appears that the machine prong of the “machine-or-transformation” test is not an efficient tool to exclude bad software patents. Rather than resolving the uncertainty that surrounds the construction of section 101, this ambiguous inquiry merely propagates unanswerable questions.<sup>89</sup> The question whether software is more like patentable machinery or an unpatentable abstraction is yet to be resolved.<sup>90</sup> Therefore, the Supreme Court should reject the Federal Circuit’s lofty machine inquiry and invoke its own settled principles, namely that “anything under the sun that is made by man”<sup>91</sup> is patentable except for “laws of nature, natural phenomena or abstract ideas”<sup>92</sup> In Part V, this article will suggest that the implementation of these principles could be facilitated by the establishment of an advisory committee of software experts that will assist the Patent Office and the courts in identifying un-patentable abstract processes that should be excluded under section 101.

### *B. The Transformation Prong of the “Machine-or-Transformation” Test*

As to the second prong of the “machine-or-transformation” test, *Bilski* found that the transformation must be “central to the purpose of the claimed process.”<sup>93</sup> The court reasoned:

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89. *Bilski*, 545 F.3d at 1015 (Rader, J., dissenting).

90. Steven J. Frank, *The Death of Business-Method Patents*, IEEE SPECTRUM, Mar. 2009, available at <http://www.spectrum.ieee.org/mar09/7909>.

91. *Chakrabarty*, 447 U.S. at 309. Recently, the U.S. Solicitor General argued, in a May 4 Brief submitted in opposition to the petition for a writ of certiorari in the *Bilski* case, that the Supreme Court in *Chakrabarty* did not provide the *full* quote. According to the full original quote in the legislative record, “[a] person may have ‘invented’ a machine or a manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.” See Posting of Brian Fletcher to PATENTABILITY, <http://www.patentabilityblog.com/tag/business-method/> (May 7, 2009). Nonetheless, it is patently clear that after *Chakrabarty*, whenever courts had cited to the quote “anything under the sun that is made by man,” they intended to invoke *Chakrabarty*’s broad interpretation of section 101.

92. *Diehr*, 450 U.S. at 185.

93. *Bilski*, 545 F.3d at 962.

So long as the claimed process is limited to a practical application of a fundamental principle to transform specific data, and the claim is limited to a visual depiction that represents specific physical objects or substances, there is no danger that the scope of the claim would wholly preempt all uses of the principle.<sup>94</sup>

The majority, however, failed to explain what kind of transformation may qualify<sup>95</sup> or when a “representative” of a physical object is sufficiently linked to that object to satisfy the transformation test.<sup>96</sup> Moreover, the requirement that the transformation must be central to the purpose of the claimed process seems inconsistent with the principle that inventions must be considered as a whole in asserting their patent eligibility under section 101.<sup>97</sup>

The uncertainty which surrounds the issue of “transformation” was well presented by Judge Bryson during *Bilski’s en banc* hearing.<sup>98</sup> Judge Bryson asked whether a curveball is patentable, and then answered: “[a] curveball is a baseball which has been, you could say, transformed into a baseball that has a great deal of spin on it and is being thrown at a pace which it didn’t have at the time it was in the pitcher’s hand.”<sup>99</sup> There are a handful of similar absurd process patents that allegedly encompass transformation: “A method and apparatus for exercising a curious animal such as a housecat comprises a laser pointer mounted on a shaft driven by a geared motor mounted on a pedestal.”<sup>100</sup> Arguably, the cat is being “transformed” from a bored cat to an amused one. Since

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94. *Id.* at 963.

95. *Id.* at 994 (Newman, J., dissenting).

96. *Id.* at 1015 (Rader, J., dissenting).

97. *Id.* at 994 (Newman, J., dissenting). As explained by Justice Newman: “It is difficult to predict an adjudicator’s view of the ‘invention as a whole,’ now that patent examiners and judges are instructed to weigh the different process components for their ‘centrality’ and the ‘significance’ of their ‘extra-solution activity’ in a Section 101 inquiry.”

98. Harkins, *supra* note 42, at 724-725.

99. Audio Recording: Oral Argument from *In re Bilski*, No. 2007-1130, May 8, 2008.

100. U.S. Patent No. 6,701,872 (filed Oct. 30, 2002).

such transformation represents something tangible (a cat), this absurd patent would have also satisfied *Bilski's* transformation requirement. Another example is a method of swinging on a swing "in which a user positioned on a standard swing suspended by two chains from a substantially horizontal tree branch induces side to side motion by pulling alternately on one chain and then the other."<sup>101</sup> Arguably, the swing is being transformed from its initial position into a different one. Since such transformation represents something tangible (the swing), this process could have been patentable under *Bilski's* "machine-or-transformation" test.

Even the *Bilski* claim itself arguably involves physical transformation.<sup>102</sup> By using *Bilski's* claimed process, providers and consumers enter into a series of transactions allowing them to buy and sell a particular commodity at a particular price.<sup>103</sup> This reflects a physical process in which telephone calls are made, meetings are held, and contracts are executed.<sup>104</sup> Arguably, market participants are transformed from a state of not being in a commodity transaction to a state of being in such a transaction.<sup>105</sup>

Furthermore, under *Bilski*, transformation of data will be patent-eligible when the data represents a "physical object or substance."<sup>106</sup> For instance, according to the *Bilski* court, the process recited in *Abele*, was held to be patent-eligible, because that data represented physical and tangible objects, namely the structure of bones, organs, and other body tissues.<sup>107</sup> However, transformation of data that represents intangibles will not be patent-eligible according to the Federal Circuit.<sup>108</sup>

This dichotomy has been strongly criticized.<sup>109</sup> Even if the transformation requirement was relevant during the industrial age,

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101. U.S. Patent No. 6,368,227 (filed Nov. 17, 2000).

102. *Bilski*, 545 F.3d at 1009 (Mayer, J., dissenting).

103. *Id.*

104. *Id.*

105. *Id.*

106. *Bilski*, 545 F.3d at 962-963.

107. *Id.* (citing *Abele*, 684 F.2d at 908-09).

108. *Id.*

109. See, e.g., Kevin Emerson Collins, *An Initial Comment on In re Bilski: Tangibility Gone Meta*, PATENTLY O, Nov. 1, 2008, <http://www.patentlyo.com/patent/2008/11/professor-collins.html>.



it appears inappropriate in the current information age.<sup>110</sup> In his comment “An Initial Comment on *In re Bilski*: Tangibility Gone Meta,” Professor Collins raised two important questions; first he asks, “why should we treat information about tangible things in a manner that is categorically different from the manner in which we treat information about intangible things?”<sup>111</sup> Collins then asks how can we determine whether data represents something tangible?<sup>112</sup> In a material universe, every process causes some kind of physical transformation, even “if only at the microscopic level or within the human body, including the brain.”<sup>113</sup> Under a broad perspective, data that represents one’s longevity may represent something physical — namely his body.<sup>114</sup> If so, then the contention that the data in *Bilski* represented something tangible, namely human actions, appears to be quite reasonable.<sup>115</sup>

Accordingly, the transformation doctrine is not the proper standard for eligible processes under section 101.<sup>116</sup> Indeed, the Patent Act itself lists “composition of matter” as a separate category of subject matter from “process.”<sup>117</sup> Moreover, the Patent Act defines “process” in section 100(b)<sup>118</sup> without any of the limitations inherent in the “machine-or-transformation” test.<sup>119</sup> Since the “transformation” prong is not tied to the other patent-eligible categories under section 101, it should not be tied to the “process” category.<sup>120</sup> Lastly and most importantly, the transformation inquiry fails to satisfy its very own objectives. As demonstrated, capricious interpretations may successfully construe absurd inventions to satisfy *Bilski*’s transformation requirement,

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110. Harkins, *supra* note 42, at 725.

111. Collins, *supra* note 109.

112. *Id.*

113. Thomas F. Cotter, *A Burkean Perspective on Patent Eligibility*, 22 BERKELEY TECH. L.J. 855, 875 (2007).

114. Collins, *supra* note 109.

115. *Id.*

116. Harkins, *supra* note 42, at 725.

117. *Id.* See also 35 U.S.C. § 101.

118. The statutory definition reads: “The term ‘process’ means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.”

119. *Bilski*, 545 F.3d at 1012 (Rader, J., dissenting).

120. Harkins, *supra* note 42, at 725.

deeming this inquiry both redundant and useless. Therefore, in Part V, *infra*, I will suggest abandoning this inquiry and instead, applying the Supreme Court's well-settled principles that exclude laws of nature, natural phenomena and abstract ideas, with the aid of an advisory committee of software experts.

#### IV. WHAT ARE "BAD" SOFTWARE PATENTS?

A patent provides its owner with a monopoly.<sup>121</sup> "It is an exception to the general rule against monopolies and to the right to access to a free and open market."<sup>122</sup> The power of Congress to grant such exclusive rights stems from the U.S. Constitution.<sup>123</sup> Congress may grant exclusive rights "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."<sup>124</sup> This limited power reflects the policy goal of the patent system: to provide an incentive to innovation on the one hand and to enable public access to innovation on the other hand.<sup>125</sup>

Patent validity affects the public as a whole.<sup>126</sup> "Too much patent protection can impede rather than promote the Progress of Science and useful Arts."<sup>127</sup> This is why abstract ideas are excluded from patent protection, and this is why the Supreme Court supports "invalidation of specious patents."<sup>128</sup> Such patents restrain free trade and raise the costs of using the underlying information.<sup>129</sup> Additionally, the cost of invalidating these patents through litigation is enormous.<sup>130</sup> It is clear why striking down

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121. *Id.* at 707.

122. *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816 (1945).

123. Bryan Treglia, *Patentable Subject Matter: Separating Abstract Ideas and Laws of Nature from Patentable Inventions*, 48 *Jurimetrics J.* 427, 430 (2008).

124. U.S. CONST. art. I, § 8, cl. 8.

125. Treglia, *supra* note 123, at 429.

126. *Id.*

127. *Lab. Corp. of Am. v. Metabolite Labs., Inc.*, 548 U.S. 124, 126 (2006).

128. Harkins, *supra* note 42, at 707.

129. *Id.*

130. *Id.* These high litigations costs are the result of two presumptions: (1)

“bad patents” is as important as upholding “good patents.”<sup>131</sup>

But what do we mean when we categorize patents as “bad”? The following section will discuss the history of software patents and then analyze the three main characteristics of bad software patents: triviality, stifling of subsequent innovation, and overbreadth.

### *A. The History of Software Patents*

When software-related inventions began to appear, they were deemed to be un-patentable subject matter by the Patent Office, courts, and commentators.<sup>132</sup> In particular, “business methods,” often involving software,<sup>133</sup> were excluded based on the notion that free competition was sufficient to encourage new ways to do business and therefore, there was no need to add further incentives through the patent system.<sup>134</sup>

The first Supreme Court case to consider the patentability of software was *Benson* in 1972.<sup>135</sup> *Benson* concerned the patentability of a computer program that converted binary coded decimal numbers into a pure binary numbers, and the Court ruled that the program was not patentable subject matter.<sup>136</sup> The Court explained that granting a patent “would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.”<sup>137</sup> It also expressed its concern that the claims “were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.”<sup>138</sup>

Following *Benson*, the Supreme Court addressed the issue of software patents in *Flook*.<sup>139</sup> The issue in *Flook* a claim that used a

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the presumption of validity, and (2) the presumption of administrative correctness (basically, that patent examiners do their work correctly).

131. *Id.*

132. Osenga, *supra* note 9, at 1092.

133. He, *supra* note 11, at 253.

134. Frank, *supra* note 90.

135. Eugene Derenyi, *Software Copyright and Software Patent*, STIKEMAN ELLIOT, Sep. 27, 2007, [http://www.stikeman.com/en/pdf/SoftwareCopyright\\_Patent\\_Derenyi\\_07.pdf](http://www.stikeman.com/en/pdf/SoftwareCopyright_Patent_Derenyi_07.pdf).

136. *Id.*

137. *Benson*, 409 U.S. at 72.

138. *Id.* at 64.

139. Osenga, *supra* note 9, at 1094.

particular mathematical formula to calculate an “alarm limit”—a value that would indicate abnormal conditions during an unspecified chemical reaction.<sup>140</sup> Arguing that the claim failed to include any limitations specifying “how to select the appropriate margin of safety, the weighting factor, or any of the other variables . . . the chemical processes at work, the [mechanism for] monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system,”<sup>141</sup> the Court rejected the claims. Although Flook’s invention was more than the algorithm itself, the Court held that post-solution steps were insufficient to distinguish this case from *Benson*.<sup>142</sup>

The last Supreme Court case to address the issue of subject-matter eligibility of software-related inventions was *Diehr*.<sup>143</sup> *Diehr* concerned a process claim for curing synthetic rubber products.<sup>144</sup> Notwithstanding the presence of a mathematical formula in the claimed process, the Court held that “an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”<sup>145</sup> Thus, the Court found this software-related invention to be patent-eligible subject matter.<sup>146</sup>

Since 1982, there have been no Supreme Court cases on issues of software patentability.<sup>147</sup> Thus, “the Federal Circuit has been left alone to harmonize information age innovations with industrial age jurisprudence.”<sup>148</sup> In *In re Alappat*,<sup>149</sup> the Federal Circuit considered the patentability of a rasterizer<sup>150</sup> that mathematically

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140. *Flook*, 437 U.S. at 586.

141. *Id.* at 586, 595.

142. *Osenga*, *supra* note 9, at 1095.

143. *Id.*

144. *Diehr*, 450 U.S. at 178-179.

145. *Id.* at 187.

146. *Osenga*, *supra* note 9, at 1096.

147. Robert E. Thomas, *Debugging Software Patents: Increasing Innovation and Reducing Uncertainty in Judicial Reform of Software Patent Law*, 25 SANTA CLARA COMPUTER & HIGH TECH. L.J. 191, 202-3 (2008).

148. Korniczky, *supra* note 4, at 12.

149. *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc).

150. The *Alappat* Court explained the claim invention as follows: “Alappat’s invention relates generally to a means for creating a smooth waveform display in a digital oscilloscope. The screen of an oscilloscope is the front of a cathode-ray tube (CRT), which is like a TV picture tube, whose screen, when in

transforms data to eliminate aliasing in a digital oscilloscope.<sup>151</sup> The court stressed that software-related inventions will be deemed non-statutory only to the extent that the claim as a whole “represents nothing more than abstract ideas.”<sup>152</sup> Accordingly, the court upheld the claimed invention and reasoned that “[t]his is not a disembodied mathematical concept which may be characterized as an ‘abstract idea,’ but rather a specific machine to produce a useful, concrete, and tangible result.”<sup>153</sup>

It has been argued that *Alappat*, with its “useful, concrete, and tangible” test, substantially lowered the software patentability hurdle.<sup>154</sup> It has also been noted that “without the approach of *Alappat*, software patents would be virtually nonexistent because the software is simply an algorithm for manipulating electronic

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operation, presents an array (or raster) of pixels arranged at intersections of vertical columns and horizontal rows, a pixel being a spot on the screen which may be illuminated by directing an electron beam to that spot, as in TV. Each column in the array represents a different time period, and each row represents a different magnitude. An input signal to the oscilloscope is sampled and digitized to provide a waveform data sequence (vector list), wherein each successive element of the sequence represents the magnitude of the waveform at a successively later time. The waveform data sequence is then processed to provide a bit map, which is a stored data array indicating which pixels are to be illuminated. The waveform ultimately displayed is formed by a group of vectors, wherein each vector has a straight line trajectory between two points on the screen at elevations representing the magnitudes of two successive input signal samples and at horizontal positions representing the timing of the two samples. Because a CRT screen contains a finite number of pixels, rapidly rising and falling portions of a waveform can appear discontinuous or jagged due to differences in the elevation of horizontally contiguous pixels included in the waveform. In addition, the presence of “noise” in an input signal can cause portions of the waveform to oscillate between contiguous pixel rows when the magnitude of the input signal lies between values represented by the elevations of the two rows. Moreover, the vertical resolution of the display may be limited by the number of rows of pixels on the screen. The noticeability and appearance of these effects is known as aliasing. To overcome these effects, *Alappat*’s invention employs an anti-aliasing system wherein each vector making up the waveform is represented by modulating the illumination intensity of pixels having center points bounding the trajectory of the vector.” *Id.* at 1537.

151. *Id.* at 1544.

152. *Id.* at 1543.

153. *Id.* at 1544.

154. Thomas, *supra* note 147, at 206.

signals inside a digital device, such as a computer.”<sup>155</sup> Indeed, the court in *Alappat* concluded its decision with the following dicta directed to the machine-implementation test:

Under the Board majority’s reasoning, a programmed general purpose computer could never be viewed as patentable subject matter under § 101. This reasoning is without basis in the law. The Supreme Court has never held that a programmed computer may never be entitled to patent protection. Indeed, the Benson court specifically stated that its decision therein did not preclude “a patent for any program servicing a computer.” Consequently, a computer operating pursuant to software may represent patentable subject matter, provided, of course, that the claimed subject matter meets all of the other requirements of Title 35. In any case, a computer, like a rasterizer, is apparatus not mathematics.<sup>156</sup>

In so concluding, the court acknowledged that certain software inventions may be patentable under section 101.

In the 1998 case *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, the Federal Circuit officially expanded the scope of patentable subject matter to include business methods.<sup>157</sup> The invention at issue in *State Street* related to a computerized accounting system that managed mutual fund investment structures.<sup>158</sup> The issue in the case was whether computer software performing the mathematical accounting steps was patentable subject matter.<sup>159</sup> The Federal Circuit held that “the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces a useful,

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155. Treglia, *supra* note 123, at 439.

156. *Alappat*, 33 F.3d at 1545 (internal citation omitted).

157. He, *supra* note 11, at 253.

158. *State Street*, 149 F.3d at 1370.

159. *Id.*

concrete and tangible result — a final share price.”<sup>160</sup> This new test was followed by *AT&T Corp. v. Excel Communications, Inc.*,<sup>161</sup> which commentators describe as standing for the premise that as long as data transformation is present and the invention produces a useful, concrete and tangible result, no rejections under section 101 should be made.<sup>162</sup>

These two decisions greatly broadened the limits of section 101 and opened the floodgates.<sup>163</sup> Afterwards, the PTO “was inundated with claims that do not involve technology, including financial methods, arbitration methods, teaching methods, and even methods for simple routines such as swinging on a playground swing.”<sup>164</sup> Indeed, in holding that software that “merely manipulates numbers, juggling them and exchanging them and transforming them into other numbers, is producing something tangible,” the court nearly eliminated the limitations under section 101.<sup>165</sup> As a result, the courts and the PTO found it necessary to reconsider the limits of subject matter patentable processes.<sup>166</sup>

The Board of Patent and Interferences began to narrow *State Street’s* reach in *Ex parte Lundgren*.<sup>167</sup> *Lundgren* reflected the PTO’s stand against the subject-matter eligibility of software-related inventions.<sup>168</sup> Although the majority upheld a method of compensating managers in a privately owned firm under the “useful, concrete and tangible” result test and rejected the “technological arts” test,<sup>169</sup> Judge Barrett’s dissent was ultimately

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160. *Id.* at 1373.

161. *AT&T Corp. v. Excel Commc’ns, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) (holding a telecommunications system with multiple long-distance service providers patentable under Section 101).

162. See Osenga, *supra* note 9, at 1102.

163. He, *supra* note 11, at 256.

164. *Id.*

165. Gleick, *supra* note 2, at 48.

166. He, *supra* note 11, at 256.

167. *Ex parte Lundgren*, 76 U.S.P.Q.2d 1385 (2005).

168. Osenga, *supra* note 9, at 1103.

169. Under the “technological art” test, claims that were outside the technological arts, i.e., “an economic theory expressed as a mathematical algorithm without the disclosure or suggestion of a computer, automated means, apparatus of any kind” were excluded as ineligible subject matter. He, *supra* note 11, at 257.

more influential.<sup>170</sup> Judge Barrett, joined by Judge Smith, concluded that the claimed process “does not fall within the definition of a process under § 101 because it does not transform physical subject matter into a different state or thing.”<sup>171</sup> The influence of this contention is reflected in the PTO 2005 Interim Examination Guidelines,<sup>172</sup> which were issued because the PTO had “seen increasing numbers of applications. . . that raise subject matter eligibility issues.”<sup>173</sup> More importantly, these guidelines determined that in deciding whether a claim invention recites a practical application of a judicial exception (i.e., abstract idea, or laws of nature), the examiner must decide whether the claimed invention “transforms” an article or physical object into a different state or thing or whether the claimed inventions produces a “useful, concrete and tangible result.”<sup>174</sup>

Following these developments, the Federal Circuit released two decisions prior to *In re Bilski* all narrowing the scope of patentable subject matter.<sup>175</sup> The claimed invention in *In re Comiskey*<sup>176</sup> was related to a “method and system for mandatory arbitration involving legal documents.”<sup>177</sup> The Federal Circuit rejected Comiskey’s claims, because they “were not tied to any machine, recited nothing more than an abstract idea, and impermissibly sought to patent the use of human intelligence in and of itself.”<sup>178</sup> In so holding, the Federal Circuit made its first step away from the broad “useful, concrete and tangible result” test.<sup>179</sup>

The second step was made in *In re Nuijten*,<sup>180</sup> which was released on the same day the Federal Circuit released *In re*

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170. Osenga, *supra* note 9, at 1104.

171. *Lundgren*, 76 U.S.P.Q.2d at 1431-1432.

172. U.S. PTO, Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, (Nov. 22, 2005) *available at* [http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines\\_10120051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines_10120051026.pdf).

173. *Id.* at 1.

174. Osenga, *supra* note 9, at 1106.

175. Korniczky, *supra* note 4, at 12.

176. *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007).

177. *Id.* at 1368.

178. Korniczky, *supra* note 4, at 12.

179. *Id.*

180. *In re Nuijten*, 500 F.3d 1346 (Fed. Cir. 2007).



*Comiskey*. The claimant in *Nuijten* disclosed a method for reducing distortion caused by the introduction of digital watermarks into a signal and included claims for the signal itself.<sup>181</sup> The court rejected the claim for the signal itself because it did not fall within any of the four statutory categories under section 101.<sup>182</sup> Thus, the majority held that the enumerated categories of inventions — process, machine, manufacture, and composition of matter — set appropriate bounds for patentable subject matter under section 101.<sup>183</sup>

### *B. What Constitutes a “Bad” Software-Related Invention?*

The question of software patentability has been considered since software-related inventions first appeared in the 1980s.<sup>184</sup> It was commonly said that patents would severely damage the software industry.<sup>185</sup> Because software inventions may be much easier to design and much cheaper to manufacture compared to hardware,<sup>186</sup> it is often argued that patents are not required to promote this type of innovation.<sup>187</sup>

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181. *Id.* at 1348-9.

182. *Id.* at 1357.

183. Scott Bloebaum, *From Telegraphs to Content Protection: The Evolution of Signals as Patentable Subject Matter Under 35 U.S.C. § 101*, 9 N.C. J.L. & Tech. 243, 265-6 (2008).

184. Frank, *supra* note 90. In a 1994 manifesto entitled “Software Patents: An Industry at Risk,” the *League for Programming Freedom* discussed “the special properties of software that make the application of the patent system inappropriate”, including “the complexity of software” and unprecedented rapid change and development. See Gordon Irlam & Ross Williams, *Software Patents: An Industry at Risk* (Jan. 25, 1994), <http://progfree.org/Patents/industry-at-risk.html>.

185. Robert P. Merges, *Software and Patent Scope: A Report from the Middle Innings*, 85 TEX. L. REV. 1627 (2007).

186. *Bilski*, for example, likely spent only negligible sums to develop his invention. A program of 100,000 components could be written by two good programmers in a year. The equipment needed for developing software costs less than \$10,000 and the total investment would be less than \$100,000. By contrast, an automobile usually contains less than 100,000 components, but it requires a large team of developers and costs tens of millions of dollars to design. See Richard Stallman & Simson Garfinkle, *Viewpoint: Against Software Patents*, 35 COMM. ACM 17 (1992).

187. Thomas, *supra* note 147, at 193.

Nonetheless, “with the persistence of rabbits in a field or termites in a fallen tree, software patents just kept showing up.”<sup>188</sup> However judged, whether by overall industry revenues, by product innovation, or by frequency of new firm entry, the industry today seems quite sound.<sup>189</sup> It appears that the more pressing questions now concern the *criteria* for issuance and the *scope* of protection to be afforded to software inventions, rather than questions of patentability per se.<sup>190</sup> Therefore, the patent system should focus on considering the contours and details of the software protection doctrine.<sup>191</sup>

Yet, because in some cases the operations of a computer program might be “too mathematical” or too close to basic laws of nature, it is hard to draw the line between unpatentable math and its patentable application.<sup>192</sup> A problem is that while all software ultimately reduces to mathematical operations, only some software controls physical things such as Diehr’s curing rubber system.<sup>193</sup> Indeed, while some software-related inventions arguably perform physical transformation of things that are tangible and predictable, some merely perform abstract calculations such as bookkeeping.<sup>194</sup> The question, however, is how to distinguish between the two.

This sub-section will argue that “bad” software inventions are trivial and absurd inventions that merely perform simple calculations or serve as building blocks for the development of other programs and computer applications.<sup>195</sup> The following section will suggest that an advisory committee of software experts should be adopted to aid the Patent Office and the courts in identifying such bad software inventions.

### 1. *Excluding Software Patents That Are Too Trivial*

Much of the hostility against software patents is founded on

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188. *Merges*, *supra* note 185, at 1628.

189. *Id.*

190. Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 3 (2001).

191. *Merges*, *supra* note 185 at 1628-29.

192. Frank, *supra* note 90.

193. *Id.*

194. Thomas, *supra* note 147, at 196-97.

195. *Id.*

examples of issued software patents that are perceived to be trivial.<sup>196</sup> Perhaps the most cited example is the Amazon.com “one-click” patent.<sup>197</sup> The “one-click” patent was based on Jeff Bezos’ idea of offering a shortcut to online purchasers. Instead of using the regular virtual “shopping cart” that presents the list of chosen items when clicked on, Bezos’ “invention” enables users to choose an item with only one click and use a shipping address and credit-card number already on file.<sup>198</sup> This patent was highly criticized for its triviality,<sup>199</sup> because it added nothing novel that is not merely “obvious”<sup>200</sup> to earlier shopping-cart systems.<sup>201</sup> Another example is Bruce Dickens’ patent titled “Date Formatting and Sorting for Dates Spanning the Turn of the Century.”<sup>202</sup> Dickens’ patent discloses:

A method for repairing databases full of now-suspect two-digit years: Pick an arbitrary cutoff (say, ‘50); if a year has a higher number, assume it belongs to the old century; if a year has a lower number, assume it belongs to the new century. Thus: ‘08, ‘11, ‘58, ‘97, become 2008, 2011, 1958, 1997.<sup>203</sup>

This invention appears trivial.<sup>204</sup> Most probably, if one hundred computer programmers skilled in their art were asked to write a code “for repairing full of now-suspect two-digit years,” at least eighty of them would have come out with a substantially similar

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196. Campbell-Kelly & Valduriez, *supra* note, 83, at 7.

197. *Id.*

198. Gleick, *supra* note 2, at 44.

199. Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 MICH. TELECOMM. TECH. L. REV. 191, 231 (2005).

200. I use the term “obvious” here in its plain and common meaning, “Easily perceived or understood; quite apparent,” and not its technical meaning under 35 USC § 103. Thefreedictionary.com, <http://www.thefreedictionary.com/obvious> (last visited May 17, 2009).

201. Gleick, *supra* note 2, at 48.

202. U.S. Patent No. 5,806,063 (filed Sep. 8, 1998).

203. James Gleick, *Who Wants to Be a Billionaire?*, AROUND, <http://www.around.com/dickens.html>.

204. *Id.*

code. However, without a threshold level of technical merit to “knock it out,” and in the absence of sufficient grounds to reject it pursuant to the novelty requirement in sections 102, the examiner had no choice other than to uphold the claimed method.

Some argue that software patents are inappropriate because software is a cumulative technology.<sup>205</sup> A software product typically depends on hundreds of previous innovations.<sup>206</sup> By nature, software inventions are incremental and are rarely written from scratch.<sup>207</sup> Generally, without their interactions with other technologies, software patents have little intrinsic value.<sup>208</sup> As a result, it is hard to evaluate the degree of innovation and the non-obviousness of a software invention with respect to the prior art pursuant to section 103 of the Patent Act.<sup>209</sup> Some argue that due to the cumulative nature of software patents, the standard of obviousness developed in other fields is inappropriate for software.<sup>210</sup>

Moreover, software inventions are sometimes not sufficiently innovative.<sup>211</sup> “When a software engineer at IBM comes up with a new idea, it’s usually safe to bet that dozens or hundreds of software engineers in cubbyholes around the world are thinking along the same lines,”<sup>212</sup> and would write substantially the same code. Any idea generated so easily and regularly is arguably trivial.<sup>213</sup> Thus, if patents should be the exception and not the rule, then software inventions should not qualify for a government-sanctioned monopoly.<sup>214</sup>

Furthermore, because hundreds of thousands of software patents exist, it is almost impossible to keep track of their inventive

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205. Campbell-Kelly, *supra* note 199, at 192.

206. Cohen & Lemley, *supra* note 190, at 41.

207. *Id.*

208. See Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 881 (1990).

209. Campbell-Kelly & Valduriez, *supra* note 83, at 7.

210. Stallman & Garfinkle, *supra* note 186, at 19.

211. Richard R. Nelson, *Intellectual Property Protection for Cumulative Systems Technology*, 94 COLUMBIA L. REV. 2674, 2674 (1994).

212. Gleick, *supra* note 2, at 51.

213. *Id.*

214. *Id.*

step.<sup>215</sup> The fact that software patents emerged out of a new field of technology also affects one's ability to resolve questions of obviousness pursuant to section 103.<sup>216</sup> The problem is that when a new field suddenly opens, there may be many things that need to be done which are "patently obvious."<sup>217</sup> Because the burden of proof rests on the examiner according to 35 U.S.C. § 131, the examiner cannot say "gee, that's obvious to me."<sup>218</sup> Rather, the examiner must base his rejections on the pertinent prior art.<sup>219</sup> However, many software improvements are not researchable in the literature.<sup>220</sup> They may be documented via developer specifications or online FAQs while the source code itself is never released.<sup>221</sup> Thus, conducting prior art searches for software patents is enormously complicated.<sup>222</sup> Given the complexity that surrounds the obviousness examination regarding software-related inventions, the necessity of a flexible examination procedure under section 101 that will function as a gatekeeper of trivial software patents appears compelling.

## 2. *Excluding Software Patents that Do Not Reflect Real Inventions*

Some software patents are merely a strategic tactic carried out by big firms to lock out competitors.<sup>223</sup> The idea is that strong ownership over software would tend to "lock in" a dominant product.<sup>224</sup> When software patents cover abstract ideas or laws of nature, they provide individuals with control over something they

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215. Richard Stallman, Software patents – Obstacles to software development, Transcript of a talk presented 2002-03-25 at the University of Cambridge Computer Laboratory, organized by the Foundation for Information Policy Research, *available at* <http://www.cl.cam.ac.uk/~mgk25/stallman-patents.html>.

216. Gleick, *supra* note 2, at 50.

217. *Id.*

218. *Id.*

219. *Id.*

220. Cohen & Lemley, *supra* note 190, at 42.

221. *Id.*

222. *Id.*

223. Campbell-Kelly & Valduriez, *supra* note 83, at 17.

224. Merges, *supra* note 185, at 1634.

did not create and enable them to prevent others from achieving results based on these principles.<sup>225</sup> By granting software patents, the patent system impedes the attempts of others to innovate.<sup>226</sup> Hence, the increase in competitors' research and development (R&D) costs results in an overall decline in innovation.<sup>227</sup> Some argue that "anyone who puts a small gloss on this fundamental technology, calls it proprietary, and then tries to keep others from building further on it, is a thief."<sup>228</sup>

Accordingly, the patent system should be wary of giving software inventors too much protection that impedes the ability of others to innovate.<sup>229</sup> Section 101, as a threshold matter, should thus enable the patent system to effectively exclude inventions that fail to solve real world problems.

### 3. *Excluding Broad Software Inventions*

Although some evidence suggests that the availability of software patents generally promotes innovation, the patent system will inevitably constrain innovation if it affords too much protection.<sup>230</sup> "Sometimes too much patent protection can impede rather than 'promote the Progress of Science and useful Arts,' the constitutional objective of patent and copyright protection."<sup>231</sup>

"A 'broad' patent is one which covers a wide area of the inventive space."<sup>232</sup> The basic objection to broad patents, one which covers a wide area of the inventive space, is based on the assertion that they stifle innovation.<sup>233</sup> They discourage competitors from developing closely related inventions and

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225. Thomas, *supra* note 147, at 195.

226. *Id.* at 210.

227. *Id.* at 193.

228. James Gleick, *The Patent That Never Was*, AROUND, <http://www.around.com/halloffame.html>.

229. Thomas, *supra* note 147, at 214.

230. Cohen & Lemley, *supra* note 190, at 5.

231. *Lab. Corp. of Am. Holdings v. Metabolite Labs, Inc.*, 548 U.S. 124, 126 (2006) (Breyer, J., joined by Stevens and Souter, JJ., dissenting from dismissal of writ of certiorari).

232. Campbell-Kelly & Valduriez, *supra* note 83, at 20.

233. Cohen & Lemley, *supra* note 190, at 16.

prevent them from entering the market.<sup>234</sup> “Pure software inventions”—software inventions that are characterized by their cumulative nature — are most commonly associated with the risk of providing too much protection.<sup>235</sup> Most inventions, including software inventions, are not pioneering advances over the prior creation. Therefore, they should not be entitled to broad protection.<sup>236</sup>

Professor Martin Campbell-Kelly from Warwick University’s Department of Computer Science and Patrick Valduriez, a research director at National Center for Computer Science in France (INRIA), provide a good example of a pure software invention that was defined sufficiently narrowly to allow competitors to design around the invention: the MP3 music compression algorithm.<sup>237</sup> Although a patent was eventually granted,<sup>238</sup> a number of industry substitutes are currently being developed, such as Microsoft’s WMA, Real Networks RAM, Apple Computer QIF, and the open source OGG format. On the other hand, some software-related inventions, called “discrete inventions,” are pioneering inventions entitled to broad protection.<sup>239</sup> Campbell-Kelly and Valduriez use the example of Texas Instruments’ “Speak & Spell” children’s educational toy: although the inventor was granted broad protection, there was no hindrance to incremental improvements.<sup>240</sup> In fact, the availability of a temporary monopoly encouraged the invention of the toy in the first place.<sup>241</sup>

Typically, however, given the lack of technical merit, software inventions are likely to be afforded more protection than they

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234. Campbell-Kelly & Valduriez, *supra* note 83, at 21.

235. See discussion on the cumulative nature of patents *supra*.

236. Cohen & Lemley, *supra* note 190, at 41.

237. Campbell-Kelly & Valduriez, *supra* note 83, at 22.

238. U.S. Patent No. 5,701,346 (filed Dec. 23, 1997).

239. Campbell-Kelly & Valduriez, *supra* note 83, at 21. A similar distinction was made by Karjala who distinguished between pure software patents, which claim improvements in programming or inventions embodied wholly in a program, and computer related patents, where the claim is for a machine or process that encompasses a computer program. See Dennis S. Karjala, *The Relative Roles of Patent and Copyright in the Protection of Computer Programs*, 17 J. MARSHALL J. COMPUTER & INFO. L. 41, 60-63 (1998).

240. Campbell-Kelly & Valduriez, *supra* note 83, at 21.

241. *Id.*

deserve.<sup>242</sup> Therefore, if courts fail to adequately consider the unique traits of software inventions,<sup>243</sup> software patents will consequently grant their owners the monopoly to control innovation in related areas.<sup>244</sup>

#### V. THE CREATION OF THE ADVISORY COMMITTEE OF SOFTWARE EXPERTS

Ultimately, there should not be a bright-line rule on how the Patent Office and the courts should determine whether a software invention is a patentable process under section 101 in order to both protect inventors' investments and safeguard the market from bad patents.<sup>245</sup> In the end, there should not be a bright line rule how the PTO and the courts must determine the patentability of process under section 101.<sup>246</sup> Rather, the Supreme Court must leave room for future technological advances to pass the threshold of section 101.<sup>247</sup> As discussed, *Bilski's* attempt to apply industrial age limitations to information age innovations is subject to failure. Indeed, while "today's software transforms our lives without physical anchors,"<sup>248</sup> *Bilski's* "machine-or-transformation" test "not only risks hobbling these advances, but precluding patent protection for tomorrow's technologies."<sup>249</sup>

*Bilski's* "machine-or-transformation" test should be abandoned, because it is ambiguous and inconsistent with Supreme Court precedent.<sup>250</sup> The Supreme Court has never held the "machine-or-transformation" test to be the sole test for patentable processes under section 101.<sup>251</sup> In fact, in both *Benson* and *Flook*, the Supreme Court was careful to avoid a rule that "would freeze §

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242. *Id.*

243. Cohen & Lemley, *supra* note 190, at 39.

244. *Id.*

245. Beth Simone Noveck, "Peer to Patent" *Collective Intelligence, Open Review, And Patent Reform*, 20 HARV. J.L. & TECH. 123, 127 (2006).

246. Harkins, *supra* note 42, at 729.

247. *Id.*

248. *Bilski*, 545 F.3d at 1015 (Rader, J., dissenting).

249. *Id.*

250. Arner, *supra* note 40.

251. *Bilski*, 545 F.3d at 977 (Newman, J., dissenting).



101 to old technologies.”<sup>252</sup> In *Diehr*, the Supreme Court’s last word on the patentability of process claims,<sup>253</sup> the Court emphasized that statutory subject matter should include “anything under the sun that is made by man.”<sup>254</sup> The Federal Circuit itself doubted its “machine-or-transformation” test when it recognized the possibility that the Supreme Court will “ultimately decide to alter or perhaps even set aside this test to accommodate emerging technologies.”<sup>255</sup>

Instead of *Bilski*’s test, courts should return to the practical, well-established standards which determine eligibility under section 101: “anything under the sun that is made by man”<sup>256</sup> should be patentable, with the exception of “laws of nature, natural phenomena, or abstract ideas.”<sup>257</sup> The implementation of these judicial limitations is not an easy task, particularly when dealing with new technologies, such as software: “Patent Examiners are often ill-prepared to evaluate software patent applications to determine if they represent techniques that are widely known or obvious- both of which are grounds for rejection.”<sup>258</sup> The reality is that more than half of the patent examiners in the field of software have been employed by the Patent Office for less than two years, and they are not required to possess an advanced degree.<sup>259</sup> Nonetheless, they have wide discretion in deciding whether to grant a twenty-year monopoly.<sup>260</sup> Indeed, commentators criticize “the frequency with which the Patent Office issues patents on shockingly mundane business inventions,”<sup>261</sup> which results in the issuance of many business method patents that are “facially (even farcically) obvious to persons outside the USPTO.”<sup>262</sup> Consequently, private parties are forced to invalidate these patents

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252. Harkins, *supra* note 42, at 729.

253. *Id.* at 182.

254. *Diehr*, 450 U.S. at 182.

255. *Bilski*, 545 F.3d at 956.

256. *Chakrabarty*, 447 U.S. at 309.

257. *Diehr*, 450 U.S. at 185.

258. Stallman & Garfinkle, *supra* note 185, at 17.

259. Noveck, *supra* note 245, at 132.

260. *Id.*

261. Rochelle Cooper Dreyfuss, *Are Business Method Patents Bad for Business?*, 16 SANTA CLARA COMPUTER & HIGH TECH. L.J. 263, 268 (2000).

262. *Bilski*, 545 F.3d at 1007 (Mayer, J., dissenting).

through excessive litigation.<sup>263</sup> The Patent Public Advisory Committee itself admitted in its Annual Report from 2007 that “the Office is receiving an ever-increasing number of highly complex cases that require increased resources for adequate examination.”<sup>264</sup>

Therefore, as this article will explain, an advisory committee of experts in the field of software that will determine the patentability of software-related inventions should be established. This Committee would consist of legal advisors, familiar with Supreme Court precedents regarding the patentability of process claims under section 101, and computer scientists — both academics and programmers — familiar with the current stage of their art. Their task will be to provide *ex-ante* advice to patent examiners during the examination process, as well as *ex-post* advice to judges during the judicial review process as to the patentability and validity of software inventions under section 101, based upon Supreme Court’s precedents.

*A. An Advisory Committee of Software Experts — Ex-Ante Advice*

“Attracting and retaining the most qualified workforce possible is ultimately the key to a successful examination system.”<sup>265</sup> Indeed, “the most sophisticated search tools, and the clearest applications and standards are unavailing if the USPTO does not hire, train, and retain talented, dedicated employees.”<sup>266</sup> Therefore, an advisory committee of software experts can assist patent examiners in identifying bad software inventions, which are either too trivial, too broad, or carry a concrete risk of stifling subsequent innovation.

Indeed, the idea of consulting outside experts for the

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263. William Krause, Sweeping the E-Commerce Patent Minefield: The Need for a Workable Business Method Exception, 24 SEATTLE U. L. REV. 79, 97 (2000).

264. U.S. PTO, Patent Public Advisory Committee Ann. Rep. 5 (2007), available at [http://www.uspto.gov/go/com/advisory/reports/ppac\\_2007\\_annualrpt.pdf](http://www.uspto.gov/go/com/advisory/reports/ppac_2007_annualrpt.pdf). [hereinafter *Report*]

265. *Id.* at 6.

266. *Id.*

examination level of patent applications is not new. Two centuries ago, it was contemplated that patent examination is “more within the information of a board of academical [sic] professors.”<sup>267</sup> Even the first patent examiner, Thomas Jefferson, consulted with Joseph Hutchinson, Professor of Chemistry at the University of Pennsylvania, before issuing a patent on an alchemical process.<sup>268</sup>

Professor Beth Simone Noveck of New York Law School previously proposed to address the problem of deficient information in the patent review process through the creation of an open patent examination, named “Peer-to-Patent.”<sup>269</sup> Professor Noveck suggested opening the examination process by allowing the scientific community to participate in determining whether an invention is truly novel or obvious.<sup>270</sup> In June 2007, the Patent Office implemented this open review model as a pilot called “Community Patent Review.”<sup>271</sup> The pilot focused on “integrating an open peer review process with the USPTO, creating and amalgamating a vetted database of prior art references to inform examination, and developing deliberation methodologies and technologies that allow community ranking of the data forwarded to the patent examiner.”<sup>272</sup>

However, the establishment of an advisory committee creates potential confidentiality problems. The members of this committee are both colleagues and potential competitors of the applicant;<sup>273</sup> hence, there exists the possibility that members of the expert committee will be biased. Therefore, as an initial requirement, the members of the expert committee should be nominated by the PTO for a period of no more than one year during which they will be precluded from obtaining other employment. In this way, their loyalty to the patentee and the public as whole will be enhanced.

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267. Noveck, *supra* note 245, at 124.

268. *Id.*

269. *Id.* at 127.

270. *Id.*

271. U.S. PTO, DRAFT STRATEGIC PLAN 2007–2012, 18 (2006), *available at* <http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012v6.doc>. *See also*, <http://www.uspto.gov/web/patents/peerpriorartpilot/>.

272. Noveck, *supra* note 245, at 128.

273. Mario Biagioli, *Bringing Peer Review to Patents*, FIRST MONDAY, June 4, 2007, <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1868/1751>.

Additionally, their familiarity with the recent state of their art will be warranted.

In addition, there are two other possible alternatives to overcome the fundamental problem of confidentiality. The first alternative is to postpone the examination process by the committee until eighteen months after the patent application is filed, because most patent applications, regardless of whether they are later granted, are published after eighteen months.<sup>274</sup> While this alternative will introduce some additional delay in the issuance of software patents, it would eliminate the confidentiality problem. In fact, according to the Official Gazette of the USPTO, dated April 21, 2009, the average filing date of software applications receiving a first office action in the last three months is July 12, 2005.<sup>275</sup> Thus, under the current examination procedure, it takes about three and half years from the filing date of software patent applications to the date of first office action. Hence, a period of eighteen months will not necessarily constitute a delay if more software examiners are hired. In any event, some delay, when carried out for the sake of improving the quality of issued software patents, is tolerable.

Alternatively, to overcome the confidentiality issue and avoid any additional delays in the examination process of software applications, committee members should be required to follow the rules that govern all USPTO employees, particularly those expressed by 35 U.S.C. § 122 and 18 U.S.C. § 2071. Pursuant to 35 USC § 122, all USPTO employees must preserve pending applications for patents in confidence until they are either published or patented.<sup>276</sup> Additionally, under 18 USC § 2071,<sup>277</sup>

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274. Noveck, *supra* note 245, at 129.

275. U.S. PTO, OFFICIAL GAZETTE 1341 (April 21, 2009), *available at* <http://www.uspto.gov/web/offices/com/sol/og/2009/week16/TOC.htm#ref19>.

276. U.S. PTO, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 101 (5<sup>th</sup> ed., 16<sup>th</sup> rev, 1994).

277. 18 U.S.C. § 2071 reads as follows:

(a) Whoever willfully and unlawfully conceals, removes, mutilates, obliterates, or destroys, or attempts to do so, or, with intent to do so takes and carries away any record, proceeding, map, book, paper, document, or other thing, filed or deposited with any clerk or officer of any court of the United States, or in any public office, or with any judicial or

different sanctions, such as suspension, removal, and even criminal penalties, are imposed on violations of the confidentiality requirement during the examination process.<sup>278</sup> Consequently, rather than postponing the examination process of software applications to eliminate conflicts of interest between the committee members' personal financial interests and their professional commitments to the patent system, this alternative allows the examination process to begin immediately after an application is filed.

Finally, to finance the establishment of this expert committee, the 2007 Patent Public Advisory Committee Recommendations should be implemented regarding the development of a "highly complex application" fee structure.<sup>279</sup> Accordingly, the Patent Office should develop a new fee structure that anticipates the real resource requirements necessary for properly examining software inventions to ensure quality examination.<sup>280</sup>

### *B. Appointing Software Experts- Ex-Post Advice*

Appointing an expert to testify as a witness pursuant to Rule 706 of the Federal Rules of Evidence is sometimes suggested as a means for the court to enhance its ability to deal with complex issues of science and technology.<sup>281</sup> A trial court may also appoint a non-testifying technical consultant, or a "special master"

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public officer of the United States, shall be fined under this title or imprisoned not more than three years, or both.

(b) Whoever, having the custody of any such record, proceeding, map, book, document, paper, or other thing, willfully and unlawfully conceals, removes, mutilates, obliterates, falsifies, or destroys the same, shall be fined under this title or imprisoned not more than three years, or both; and shall forfeit his office and be disqualified from holding any office under the United States. As used in this subsection, the term "office" does not include the office held by any person as a retired officer of the Armed Forces of the United States.

278. *Id.*

279. *Report, supra* note 264, at 6.

280. *Id.*

281. FED. COURTS STUDY COMM., REPORT OF THE FEDERAL COURTS STUDY COMMITTEE 97 (1990).

pursuant to Rule 53 of the Federal Rules of Civil Procedure,<sup>282</sup> to assist the judge in understanding highly complex issues.<sup>283</sup> This sub-section will argue that federal courts should exploit these mechanisms and consult with software experts to determine patent-eligibility of software inventions under section 101 of the Patent Act. Indeed, as the “Manual on Scientific Evidence”<sup>284</sup> reveals, some judges do utilize these authorities when confronted with patent law cases. Indeed, more than half of the judges that participated in Joe S. Cecil and Thomas E. Willging’s survey mentioned patent law cases are a type of cases that often necessitates the appointment of experts.<sup>285</sup> Nonetheless, this sub-section recommends turning this practice into a routine procedure exploited by courts in all cases concerning questions of eligibility of software patents under section 101.

Pursuant to Rule 706 of the Federal Rules of Evidence, trial courts have wide discretion to appoint experts when the experts are likely to clarify issues under consideration.<sup>286</sup> One case which demonstrates the important function of court-appointed experts in cases concerning computer programs is *Computer Associates International, Inc. v. Altai, Inc.*<sup>287</sup> The issue in *CA International* was how to determine “substantial similarity” between two computer programs to prove copyright infringement.<sup>288</sup> Because of the extensive technical evidence and expert testimony anticipated from both sides, the court appointed its own expert from the Massachusetts Institute of Technology, pursuant to Rule 706.<sup>289</sup> In this particularly interesting appointment, the appointed expert went beyond analyzing and interpreting the facts of the case and also suggested his own alternative legal analysis to bring the copyright law protecting computer software into compliance with

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282. FED. R. CIV. P. 53.

283. FED. R. EVID. 706.

284. Joe S. Cecil & Thomas E. Willging, *Court-Appointed Experts*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 525, 539 (Washington, DC: Federal Judicial Center, 1994).

285. *Id.* at 539-540.

286. *Id.* at 533.

287. *Computer Assoc. Int’l, Inc. v. Altai, Inc.*, 775 F. Supp. 544 (E.D.N.Y. 1991).

288. *Id.* at 558.

289. *Id.* at 549.

the practices in the field of computer science.<sup>290</sup> On appeal, when one party argued that the district court had erred in relying on the court-appointed expert's opinions, the Court of Appeals explained that the complex technical nature of computer software justified expanding the role of the expert in that case.<sup>291</sup> A similar justification should support the appointment of software experts that will aid courts in developing guidelines to determine patent-eligibility of software patents under section 101, as this issue is highly complex.

Federal courts also have an inherent authority to appoint technical advisors.<sup>292</sup> The role of a technical advisor is to advise the court, but not to provide evidence or decide the case.<sup>293</sup> The appointment of a technical advisor will be justified in cases that raise problems of unusual difficulty, sophistication, and complexity, or involve issues well beyond the regular questions of fact and law which judges routinely face.<sup>294</sup> In *TechSearch L.L.C. v. Intel Corp.*, for instance, the Federal Circuit affirmed the district court's appointment of a technical advisor. *TechSearch* concerned infringement litigation over a complex patent on "a method or computer for 'emulating' target instructions of the instruction set of a target computer using, inter alia, 'emulation registers' capable of corresponding to registers in the target computer."<sup>295</sup> The Federal Circuit considered the role of a technical advisor in assisting the court in understanding the scientific and technical evidence presented and explained that in patent cases, "such evidence. . . includes expert testimony, scientific articles and texts, and patents, upon which the court must rely in understanding the technology so that it can interpret the patent claims and determine whether to grant motions for summary judgment of validity, invalidity, infringement or noninfringement."<sup>296</sup> Because the district court had to consider and understand complex technical

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290. Cecil & Willging, *supra* note 284, at 533.

291. *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 713–14 (2d Cir. 1992).

292. *TechSearch L.L.C. v. Intel Corp.*, 286 F.3d 1360 (Fed. Cir. 2002).

293. Cecil & Willging, *supra* note 284, at 534.

294. *Id.* at 534.

295. *TechSearch*, 286 F.3d at 1370.

296. *Id.* at 1377.

concepts beyond normal technical and scientific facts, the Federal Circuit concluded that the appointment was appropriate.<sup>297</sup> Accordingly, because the questions of patent-eligibility of software under section 101 are complex and sophisticated, this authority may also provide a legal justification for considering *ex post* advices from software experts. However, if these software experts will eventually be required to testify, they will have to be nominated pursuant to Rule 706 of the Federal Rules of Evidence.<sup>298</sup>

Alternatively, courts may utilize their authority to appoint special masters pursuant to Rule 53 of the Federal Rules of Civil Procedure.<sup>299</sup> Indeed, special masters have been appointed for their expertise in specific fields, such as accounting, finance, science and technology.<sup>300</sup> With respect to patent cases, the Federal Circuit has acknowledged that “where complicated issues of patent law are involved, the appointment of an experienced attorney is quite appropriate.”<sup>301</sup> Indeed, Rule 53 authorizes such appointments to aid judges in handling pretrial matters tried without a jury<sup>302</sup> “that cannot be addressed effectively and timely by an available district court judge or magistrate judge of the district.”<sup>303</sup> The appointment of a special master involves largely the same considerations discussed *supra* with respect to court-appointed experts and technical advisors. Special masters must produce a report on the matters investigated, including any findings of fact or conclusions of law.<sup>304</sup> The parties may stipulate that the special master’s findings of fact will be accepted as final, leaving only questions of law for review.<sup>305</sup> Otherwise, the court must decide *de novo* all objections to a special master’s findings of

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297. *Id.* at 1379.

298. MANUAL FOR COMPLEX LITIGATION (Fourth) § 11.51 (2004) [hereinafter MANUAL FOR COMPLEX LITIGATION]

299. Fed. R. CIV. P. 53

300. MANUAL FOR COMPLEX LITIGATION, *supra* note 298, § 11.52.

301. *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1567 (Fed. Cir. 1988).

302. MANUAL FOR COMPLEX LITIGATION, *supra* note 298, § 11.52.

303. FED. R. CIV. P. 53(a)(1)(C).

304. FED. R. CIV. P. 53(e).

305. MANUAL FOR COMPLEX LITIGATION, *supra* note 298, § 11.52.



fact.<sup>306</sup>

Hence, with respect to patent cases concerning patent-eligibility of software patents, courts should exploit their authority to appoint a special master with expertise in software, who will aid them in determining patent eligibility under section 101 of the Patent Act. Indeed, section 16 of the Patent Reform Act of 2007 recognized the advantages of using special masters in patent cases and required the Director of the Administrative Office of the United States Courts to conduct a study of the use of special masters in patent litigation.<sup>307</sup> Thus, this Act also recommends expanding the use of special masters to patent infringement cases.

To insure the fairness of the proceeding, the identification and selection process of an expert, technical advisor or special master who will aid federal courts must be neutral.<sup>308</sup> The appointed expert should be able to perform an analysis under section 101 based on the general knowledge accepted in the field of software, regardless of his or her personal interests. Courts should make every effort to appoint an expert acceptable to the parties.<sup>309</sup> In this way, the risk of bias will be minimized.

## VI. CONCLUSION

“These are critical times in our nations. With the search for alternative fuel sources in order to gain energy independence, the need for cutting-edge innovation has never been greater.”<sup>310</sup> Thus, rather than undermining the patent system with an ineffective, allegedly bright line rule, courts should focus on insuring the issuance of quality patents. The patent system should retain its flexibility to exclude “bad inventions,” in particular software-related inventions that are likely to impede subsequent innovation, to be too trivial or to be afforded too much protection.

As this article demonstrated, “by holding on to one-fits-all notions of invention”<sup>311</sup> the patent system ignores the unique

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306. *Id.*

307. H.R. 1908, 110th Cong. (2007).

308. Cecil & Willging, *supra* note 284, at 544.

309. MANUAL FOR COMPLEX LITIGATION, *supra* note 298, § 11.51.

310. Harkins, *supra* note 42, at 733.

311. Biagioli, *supra* note 273.

characteristics of software patents. Indeed, *Bilski*'s "machine-or-transformation" test fails to address the unique traits of software inventions, which on the one hand, can be easily tied to a particular machine, i.e. ROM, and on the other hand, can be easily construed to transform data that represents physical things, i.e. human actions.

Therefore, this article proposed a special examination procedure that is adapted to their unique traits. Indeed, "at this juncture, when neither Congress nor the U.S. Supreme Court is certain to enact patent reform, changing the administrative practices of the agency responsible for implementing patent law may be the best opportunity . . . to effect reform."<sup>312</sup>

The proposed solution builds on the aid of external experts in determining patentability of software inventions under section 101, during both the examination process at the Patent Office and the judicial review process. This is not a perfect solution. The proposed advisory committee has to be selected, vetted, and approved, and disputes can arise over membership.<sup>313</sup> Conflicts of interest must be identified and resolved and experts must be convinced to join.<sup>314</sup> Additionally, appointing software experts as advisors during the judicial phase represents a striking departure from the adversarial process.<sup>315</sup>

Nonetheless, between *Bilski*'s allegedly bright line rule, which seeks to exclude many of the kinds of inventions that apply today's electronic and photonic technologies,<sup>316</sup> and an undefined, "I know it when I see it"<sup>317</sup> criteria, which relies solely on the exclusion of three vague judicial exceptions, the proposed solution is the lesser of three evils. Therefore, the Supreme Court should overrule the Federal Circuit's attempt to define a rigid "bright line" test,<sup>318</sup> and instead adopt the examination procedure this article has proposed.

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312. Noveck, *supra* note 245, at 128

313. *Id.* at 142.

314. *Id.*

315. Cecil & Willging, *supra* note 284, at 540.

316. *Bilski*, 545 F.3d at 976 (Newman, J., dissenting).

317. Justice Potter Stewart used this phrase to describe the threshold of obscenity in *Jacobellis v. Ohio*, 378 U.S. 184 (1964).

318. *Id.*

